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ATK4001  
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# CORROSION

## ON RURAL ELECTRIC DISTRIBUTION SYSTEMS

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SLIDE-CASSETTE TRAINING PACKET NARRATIVE A-66

RURAL ELECTRIFICATION ADMINISTRATION

U.S. DEPARTMENT OF AGRICULTURE

SEPTEMBER 1978

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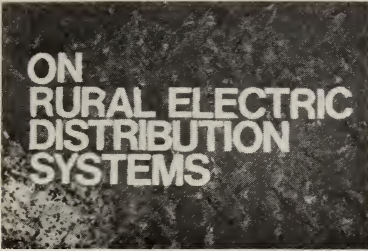
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PROJECTIONST'S NOTE: This slide-cassette series is intended for showing with manual- or remote-controlled, tray- or cartridge-equipped slide projector and cassette tape recorder. The presentation is designed to begin on a focus frame placed before the first frame and end on a blank placed after the final frame. Load slides with numbered side away from lens, number in upper right-hand corner. A pause followed by a tone is your signal to advance the slide tray to the next slide.



1. (Music)



2. (Music)



3. Corrosion has always occurred on electric distribution systems. In the past, with the majority of plant in overhead distribution lines, damage was usually scattered and infrequent.

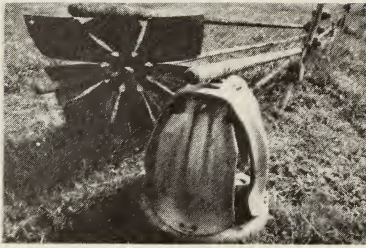


4. In recent years, the rapid shift to underground electric facilities, . . .

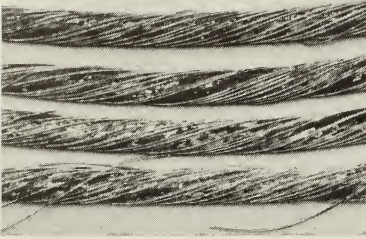


5. . . .coupled with the switch to nonmetallic buried facilities for other services, . . .





6. . . .has greatly increased corrosion problems on rural electric distribution systems. Steel anchor assemblies, ground rods, and other buried metallic structures connected to the electric system neutral have become extremely vulnerable.



7. Furthermore, corrosion of the copper neutral wires on underground electric cable itself (commonly known as URD cable) has become an additional problem.



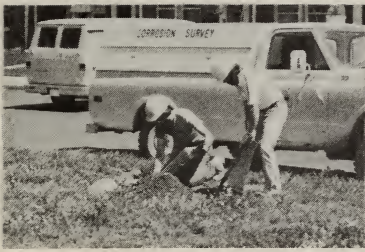
8. However, URD cable is mandatory in many localities. It also has many advantages, . . .



9. . . .both aesthetic. . .



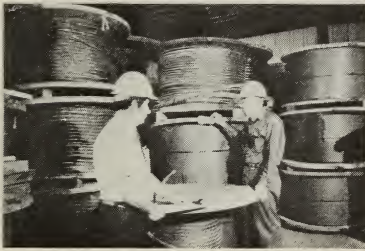
10. . . .and practical.



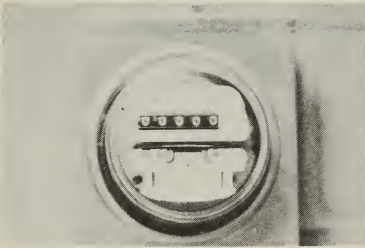
11. Current technology permits us to control corrosion at a relatively moderate cost if we locate it in time.



12. Responsible management cannot afford to be uninformed or ignore the threats corrosion poses.



13. Uncontrolled, corrosion can be a tremendous expense to a system. There are the high costs of replacing damaged materials, . . .



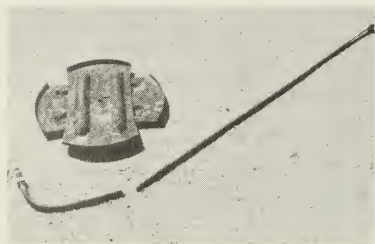
14. . . .and there are other costs more difficult to compute: the revenues lost from downtime;



15. the erosion of public good will from service interruptions;



16. and excavation damage to lawns and shrubbery.



17. Corrosion poses a threat to service reliability. Failure of a severely corroded anchor assembly could allow a pole to fall and disrupt electric service to a large segment of the system.



18. Anchor assemblies near underground cables are especially vulnerable because of the influence of the cable's copper neutral wires.



19. Loss of neutrals through corrosion could not only impair service reliability, . . .

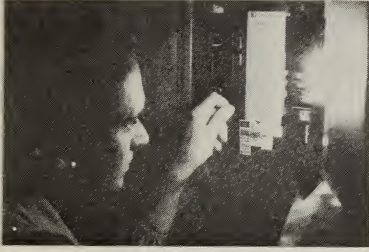


20. . . but also affect the safe operation of a system.





21. Uncontrolled, corrosion can create at least three major problems for a rural distribution system. It can add to operating expenses;



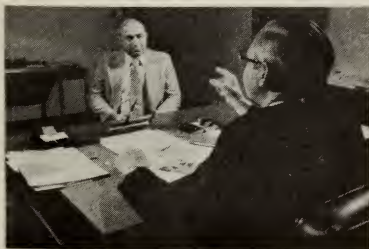
22. it can cause outages;



23. and it can create safety hazards.



24. A well-planned corrosion control program is the best solution. Such a program requires that management establish procedures and follow through to see that they are carried out.



25. One of the best ways to accomplish this is to designate an employee to specialize in the subject.



26. Line crews must become acquainted with the techniques of corrosion prevention and control.



27. Management and employees must understand the seriousness of corrosion and work together to keep it under control.



28. For existing facilities, protection against corrosion involves first locating the problem areas.



29. Outside crews can be helpful in this by being alert for signs of corrosion whenever cables or anchor assemblies are exposed, removed, or replaced.



30. Employees should be watchful for slack guys—an easily visible first warning of anchor rod corrosion.



31. Unfortunately, corrosion damage is not always so obvious and may not be detected during routine system maintenance.



32. An effective ongoing inspection program is the only sure way to catch problems before they become severe.



33. Management should establish a program of periodic surveys to examine a certain percentage of the system each year.



34. One part of the survey would involve aboveground electrical testing at guys.

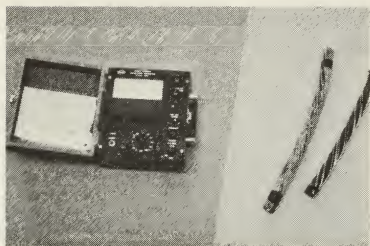


35. In addition, aboveground electrical testing along URD cable. . .

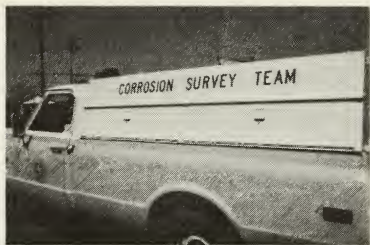




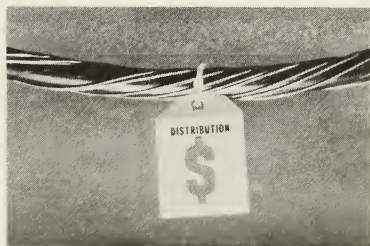
36. . . .would be combined with occasional excavation and inspection.



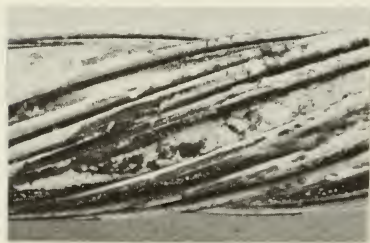
37. The correlation of test data and corresponding inspection data helps establish a relationship between the measurements and actual metal conditions.



38. Once a corrosion problem is discovered, it can almost always be halted and controlled. Existing plant can be effectively protected.



39. A corrosion control program must be considered a basic cost of maintaining underground cable, just as a pole inspection and replacement program is considered a basic cost of maintaining pole lines.

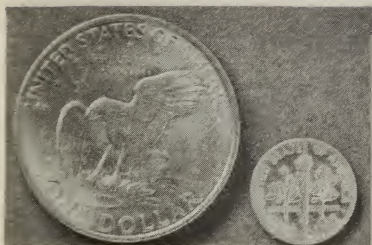


40. Don't put it off. Unprotected cable or anchor assemblies can be severely damaged by corrosion in less than 2 years.





41. The cost of replacing 1 mile of corrosion-damaged three-phase cable is 20 times the cost of simply adding protection to that same cable before corrosion starts.



42. For new facilities, proper corrosion control measures installed at the time of original construction usually add less than 10 percent to construction costs.



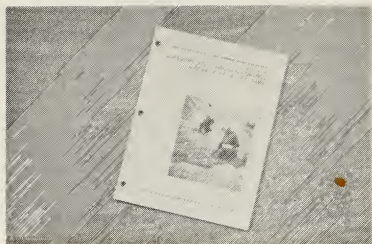
43. Corrosion should be considered in the design, construction, and maintenance of all underground distribution facilities. Corrosion protection should become a required part of all underground construction.



44. Protective measures are essential to the reliable, . . .



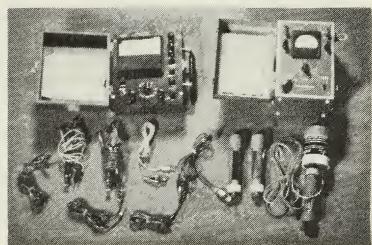
45. . . safe operation of the system, whether they are applied at the time of original construction or later in the life of the facilities.



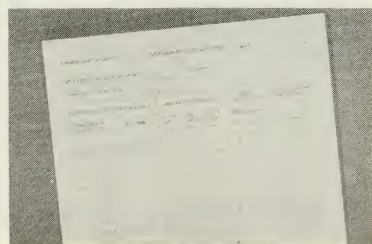
46. To fill the need for a program which borrowers can use to minimize corrosion damage and expense, the Rural Electrification Administration has issued Bulletin 161-23, "Manual on Underground Corrosion Control in Rural Electric Systems."



47. This publication gives practical guidelines for locating and measuring the extent of corrosion, instituting preventive measures, and making repairs.



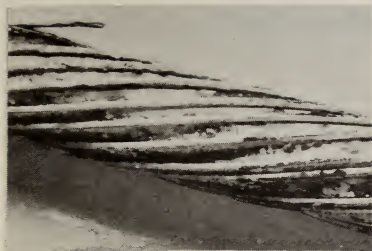
48. Subjects covered include how to use test apparatus and how to make measurements.



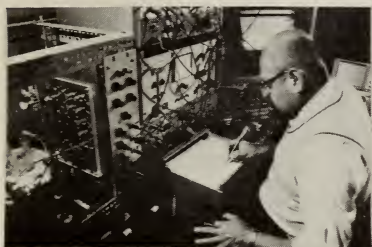
49. Conditions that underground corrosion tests may reveal and the recording and interpretation of such data are described.



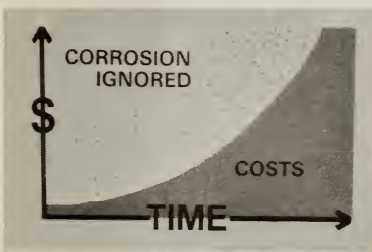
50. Other sections are devoted to corrective procedures where underground corrosion has occurred and to methods of construction to avoid future problems.



51. To summarize: Corrosion can present a real and present threat to any electric system, especially one with underground distribution cable.



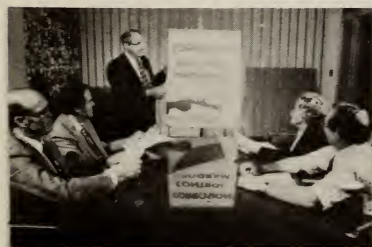
52. Corrosion can be prevented and controlled. Ongoing corrosion research will provide better answers for the future.



53. Ignored, corrosion will not disappear. It will show up eventually in costly repairs or replacements and in possible service interruptions.

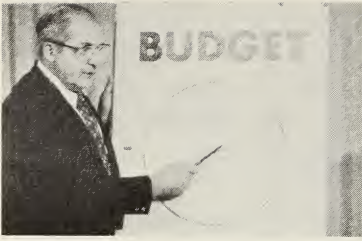


54. The responsibility for a corrosion prevention program starts with the system's management. Management must make a commitment;



55. establish a program;

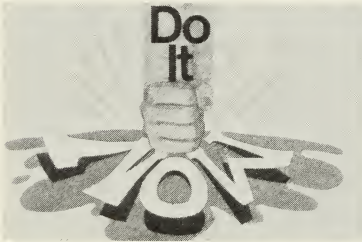




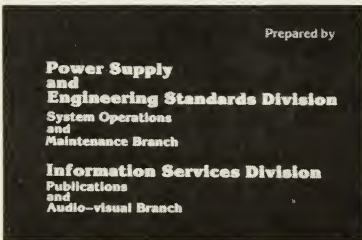
56. develop a budget;



57. and hire and train personnel.



58. You must take action—NOW!



59. (Music)



60. (Music)



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Principal Photographer: Fred S. Witte, USDA

